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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] A code translation transmission method with which especially this invention transmits the coded audio information about audio-coded-data transmission technology, It is related with the program which performs the code translation receiving method which receives the audio information by which code translation was carried out, a system and audio code translation transmission equipment, a code translation receiving set, and audio code translation transmission / audio code translation reception by computer.

[0002]

[Description of the Prior Art] In recent years, many methods of transmitting the coded data based on the highly efficient compression based on MDCT (Modified Discrete Cosine Transform) are used by making audio information into the method of transmitting efficiently. In these systems, an audio signal is divided into a frame, MDCT conversion is carried out, a quantifying bit number is assigned to a MDCT coefficient based on a mental auditory model, and a MDCT coefficient is quantized and transmitted. By carrying out compression encoding highly efficiently, audio information transmission in few transmission bands is enabled. [0003] As the example of representation, there are MPEG (Moving Picture Expert Group)-4 AAC (Advanced Audio Coding) etc.

[0004]

[Problem to be solved by the invention] However, in the conventional audio transmission method, if the error of transmission data with the long burst nature which cannot be restored, and lack of a transmission packet occur even if it uses an error correcting code, by a receiver, audio information of the frame which the error generated cannot be decrypted correctly. Although there is the error concealment technique which has been decoded correctly and which is replaced by the audio signal of a front frame in time as a measure in a receiver, it is

impossible to lose degradation of tone quality. When the inter frame prediction of a MDCT coefficient is used together and encoding efficiency is being raised, there is a problem that degradation generated once will spread also to a succeeding frame.

[0005]And in the distribute information by multicasting/broadcasting, the method of transmitting the lack information on the error of send data or a transmission packet to the transmitting side from a receiver cannot be used. When turning up error information from a receiver and transmitting to the transmitting side, a zone is also is occupied by this feedback information.

[0006]This invention is made in consideration of the above-mentioned situation, and the 1st purpose of this invention, It is in providing the code translation transmission method of the audio information which made it possible to suppress remarkable degradation of the receiver decoding audio signal produced by the transmission error of audio coded data to the grade which is not auditorily conspicuous, a receiving method, equipment and a system, and a program.

[0007]The 2nd purpose of this invention is to provide a code translation transmission method of audio information which enabled a user's setting out of a trade-off of a transmission band and tone quality which can be used for audio information transmission, a receiving method, equipment and a system, and a program.

[0008]The 3rd purpose of this invention is to provide a code translation transmission method of audio information which prevents increase of an operation amount which a decoding of audio compression coded data takes, a receiving method, equipment and a system, and a program.

[0009]The 4th purpose of this invention is to provide a method, equipment, a system, and a program which attain the 1st purpose of the above, without sending feedback information from a receiver to the transmitting side.

[0010]

[Means for solving problem]Equipment concerning this invention which solves at least one of the aforementioned problems, It is the audio code translation transmission equipment which inputs and changes audio coded data and is outputted to a transmission line, . [whether a stream of audio coded data produced by decoding and carrying out recoding of a stream of said inputted audio coded data and said inputted audio coded data is outputted, respectively, and] Or it has two or more audio code translation transmitting means which output two or more audio coded data produced by carrying out recoding of the data which decrypted said inputted audio coded data, respectively, respectively, Said two or more audio code translation transmitting means output said audio coded data and/or said all audio coded data that carried out recoding, or one selected copy, Said two or more audio coded data from said two or more audio code translation transmitting means is considered as composition sent out on one a transmission line or two or more transmission lines. An audio code translation receiving set which receives audio coded data transmitted to a transmission line from this audio code

translation transmission equipment in this invention, It has a means to choose a transmission line received among said 1 or two or more transmission lines, and a means to reconstruct audio coded data based on coded data which received audio coded data and was received normally from said selected transmission line.

[0011]Code translation transmission equipment concerning one aspect of this invention, (a) The 1st audio code translation transmitting means that inputs compressed audio coded data and outputs all the frames of said inputted audio coded data, or a frame of one copy, (b) Decrypt all or some of inputted audio coded data, The 2nd thru/or the Nth (however, N two or more predetermined integers) audio code translation transmitting means which outputs all the frames of coded data obtained by coding data produced by decrypting, or a frame of one copy, (c) It has a means to send out an output of the said 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line.

[0012]Code translation transmission equipment concerning other aspects of this invention, (a) The 1st audio code translation transmitting means that inputs compressed audio encoding packet data and outputs all the packets of said inputted audio coded data, or some packets, (b) Decrypt said inputted audio encoding packet data, The 2nd thru/or the Nth (however, N two or more predetermined integers) audio code translation transmitting means which outputs all the packet data obtained by coding data produced by decoding, or packet data of one copy, (c) It has a means to send out an output of the said 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line.

[0013]A code translation receiving set concerning other aspects of this invention, (e) A selecting means which chooses from the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line a transmission line which receives coded data, (f) Coded data which received coded data from a transmission line selected by said selecting means, and there is no transmission error, and there is no lack, and was received is extracted, and it has a means to reconstruct and output coded data, based on extracted coded data.

[0014]A code translation receiving set concerning other aspects of this invention, (e) A selecting means which chooses from the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line a transmission line which receives coded data, (f) Coded packet data which received coded data from a transmission line selected by said selecting means, and there was no transmission error, or there is no lack and were received are extracted, and it has a means to reconstruct and output coding packet data, based on extracted coding packet data.

[0015]A code translation transmission method concerning other aspects of this invention, (a) The 1st audio code translation transmitting means inputs compressed audio coded data, A

step which outputs all the frames (or packet) of said inputted audio coded data, or a frame (or packet) of one copy, (b) The 2nd thru/or Nth (however, N two or more predetermined integers) audio code translation transmitting means, All or some of inputted audio coded data is decrypted, respectively, A step which outputs all the frames (or packet) of coded data obtained by coding data produced by decrypting, or a frame (or packet) of one copy, (c) A step which sends out an output of the said 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line is included.

[0016]A code translation receiving method concerning other aspects of this invention, (d) A step which chooses from the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line a transmission line which receives audio coded data, (e) Audio coded data (packet) which received coded data from said selected transmission line, and there is no transmission error, and there is no lack, and was received is extracted, and a step which reconstructs and outputs audio coded data is included based on extracted coded data (packet data).

[0017]A computer program concerning other aspects of this invention, It has the 1st audio code translation transmitting means and the 2nd thru/or Nth (however, N two or more predetermined integers) audio code translation transmitting means, In a program which makes a computer which constitutes code translation transmission equipment of audio information perform code translation transmitting processing of audio coded data, (a) Processing to which the 1st audio code translation transmitting means inputs compressed audio coded data into, and outputs all the frames of said inputted audio coded data, or a frame of one copy, (b) The 2nd thru/or Nth (however, N two or more predetermined integers) audio code translation transmitting means, Processing which outputs all the frames of coded data obtained by coding data which decrypted all or some of inputted audio coded data, respectively, and was produced by decrypting, or a frame of one copy, (c) It consists of a program for making said computer perform processing which sends out an output of the said 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth (however, M one or more predetermined integers) transmission line.

[0018]A computer program concerning other aspects of this invention, It is a program which makes a computer which constitutes a code translation receiving set of audio information perform code translation processing of audio coded data, (d) Processing which chooses at least one transmission line from M transmission lines (however, M one or more predetermined integers), (e) Audio coded data is received from a selected transmission line, and there is no transmission error, It consists of a program for there being no lack, extracting received coded data (packet data), and making said computer perform processing which reconstructs and outputs audio coded data based on extracted coded data (packet data).

[0019][An outline of invention] In order to prevent degradation of remarkable decoding tone quality by a transmission error of audio compression coded data in this invention, Code translation transmission equipment receives coded data from audio encoding equipment, and it changes into a system which has tolerance in a data loss in a transmission line, and a data error, and transmits to the code translation receiving set side.

[0020]In this invention, code translation transmission equipment The 1st thru/or the Nth audio code translation transmitting means, It has a transmitting means to those the 1st thru/or Mth transmission line, and compression encoding of the audio information is carried out to N coded data, it transmits, and the code translation receiving set side chooses and decrypts good coded data of tone quality with the lowest compression ratio in coded data received normally from M transmission lines.

[0021]In this invention, N coded data obtained by the 1st thru/or Nth audio code translation transmitting means is transmitted, vacating a time interval which changes uniformly or accommodative, respectively.

[0022]In this invention, the code translation receiving set side chooses and decrypts good coded data of tone quality with the lowest compression ratio by frame or a packet unit out of coded data normally received from at least one transmission line of M transmission lines.

[0023]In this invention, a compression ratio of the 1st thru/or Nth audio code translation transmitting means can be chosen in accordance with a transmission band which can be used in the 1st thru/or the Mth transmission line. It can code with a compression ratio higher than the 1st audio code translation transmitting means, equivalent, or it, or the 2nd thru/or Nth audio code translation transmitting means can be set up arbitrarily.

[0024]In this invention, in order to prevent operation amount increase by a receiver accompanying two or more coded data transmission, the code translation transmission equipment side generates coded data of the same frame, and a receiver is chosen and decrypted by at least one frame or a packet unit out of two or more received coded data.

[0025]In audio information conversion Transmission Systems Division concerning the 1st aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, more specifically the code translation transmission equipment side, a) Some frames which inputted compressed coded data and were chosen accommodative in accordance with character or a rule defined beforehand of all the frames or input audios, The 1st audio code translation transmitting means that performs control which transmits using a predetermined transmission means, b) Decrypt inputted coded data, and carry out compression encoding so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, Some frames selected in accordance with character or a rule defined beforehand of all the frames of obtained coded data, or input audios accommodative, The 2nd which performs control which places a time interval which

changes uniformly or accommodative, and transmits using transmission means same as or different from the 1st audio code translation transmitting means thru/or an audio code translation transmitting means of the Nth individual (N-1), c) Choose a compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means in accordance with a zone which can be used for the 1st thru/or each Mth transmission line, It has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, Coded data which received N coded data from a selected transmission line, and there was no transmission error, or there is no lack and was received was extracted, and it has a selecting means which chooses and outputs audio coded data based on a compression ratio out of coded data of the same frame.

[0026]In audio information conversion Transmission Systems Division concerning the 2nd aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, Input the compressed coding packet data and a) All the packets, Or the 1st audio code translation transmitting means that performs control which transmits some packets selected in accordance with the character or the rule defined beforehand of an input audio accommodative using a predetermined transmission means, b) So that the inputted coding packet data may be decrypted and it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, The transmission means which is the same as or different from the 1st audio code translation transmitting means in the packet data chosen as packet data accommodative in accordance with the character or the rule defined beforehand of all the packet data obtained by carrying out compression encoding or input audios is used, The 2nd which performs control which places the time interval which changes uniformly or accommodative, and transmits thru/or the audio code translation transmitting means of the Nth individual (N-1), c) Choose the compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means in accordance with the zone which can be used for the 1st thru/or each Mth transmission line, It has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from M transmission lines, It has the selecting means which chooses and outputs coding packet data based on a compression ratio out of the packet data of the same frame which received a maximum of N coded data from the selected transmission line, and there was no transmission error, or there is no lack and were received.

[0027]In audio information conversion Transmission Systems Division concerning the 3rd aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, d) All the frames of audio information which inputted compressed coded data and was decrypted, Or some frames

selected in accordance with character or a rule defined beforehand of an input audio accommodative, The 1st audio code translation transmitting means that carries out compression encoding and performs control which transmits obtained coded data using a predetermined transmission means so that it may become a compression ratio higher than it equivalent to inputted audio information or, e) All the frames which said 1st audio code translation transmitting means coded, Or some frames selected in accordance with character or a rule defined beforehand of an input audio accommodative, It codes so that it may become a compression ratio higher than it equivalent to the 1st audio code translation transmitting means or, The 2nd which performs control which places a time interval which changes obtained coded data uniformly or accommodative using transmission means same as or different from the 1st audio code translation transmitting means, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), f) In accordance with a zone which can be used for the 1st thru/or each Mth transmission line, a compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a g M piece transmission line, Coded data which received N coded data from a selected transmission line, and there was no transmission error, or there is no lack and was received was extracted, and it has a selecting means which chooses and outputs audio coded data based on a compression ratio out of coded data of the same frame.

[0028]In audio information conversion Transmission Systems Division concerning the 4th aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Carry out compression encoding so that inputted coding packet data may be decrypted and it may become a compression ratio higher than it equivalent to inputted audio information or, The 1st audio code translation transmitting means that performs control which transmits a piece or two or more coding packet data which were obtained using a predetermined transmission means, b) All the packet data which said 1st audio code translation transmitting means coded, Or packet data selected in accordance with character or a rule defined beforehand of an input audio accommodative are received, It codes to packet data so that it may become a compression ratio higher than it equivalent to the 1st audio code translation transmitting means or, A transmission means which is the same as or different from the 1st audio code translation transmitting means in obtained coding packet data is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), and c) It unites with a zone which can be used for the 1st thru/or each Mth transmission line, A compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means was

chosen, and it has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, It has a selecting means to which a compression ratio chooses and outputs the lowest coding packet data out of packet data of the same frame which received N coded data from a selected transmission line, and there was no transmission error, or there is no lack and were received.

[0029]In audio information conversion Transmission Systems Division concerning the 5th aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, code translation transmission equipment, a) The 1st audio code translation transmitting means that performs control which inputs coding packet data and transmits using all these frames/packets, or an one-copy predetermined transmission means, b) All the packet data which said 1st audio encoding means coded, Or packet data selected in accordance with the character or the rule defined beforehand of an input audio accommodative are received, The transmission means which is the same as or different from the 1st audio code translation transmitting means in the packet data obtained by reproducing a packet is used, The 2nd which performs control which places the time interval which changes uniformly or accommodative, and transmits thru/or the audio code translation transmitting means of the Nth individual (N-1), and c) It has a means to send out the output of the 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, It has the selecting means which chooses and outputs coding packet data out of the packet data of the same frame which received N coded data from the selected transmission line, and there was no transmission error, or there is no lack and were received.

[0030]In audio information conversion Transmission Systems Division concerning the 6th aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, code translation transmission equipment, a) Input compressed coded data and decrypt inputted coded data, Compression encoding is carried out so that it may become a compression ratio higher than it equivalent to inputted coded data or, The 1st audio code translation transmitting means that performs control which transmits a frame selected in accordance with character or a rule defined beforehand of all the frames or input audios accommodative using a predetermined transmission means, b) Decrypt inputted coded data, and carry out compression encoding so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, A frame selected in accordance with character or a rule defined beforehand of all the frames of obtained coded data, or input audios accommodative, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits using transmission means same as or different from the 1st audio code translation transmitting means thru/or an audio

code translation transmitting means of the Nth individual (N-1), c) Unite with a zone which can be used for the 1st thru/or each Mth transmission line, A compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, Coded data which received N coded data from a selected transmission line, and there was no transmission error, or there is no lack and was received was extracted, and it has a selecting means to which a compression ratio chooses and outputs the lowest audio coded data out of coded data of the same frame.

[0031]In audio information conversion Transmission Systems Division concerning the 7th aspect of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, code translation transmission equipment, a) Input compressed coding packet data and decrypt inputted coding packet data, Compression encoding is carried out so that it may become a compression ratio higher than it equivalent to inputted coded data or, The 1st audio code translation transmitting means that performs control which transmits a packet selected in accordance with character or a rule defined beforehand of all the packets or input audios accommodative using a predetermined transmission means, b) So that inputted coding packet data may be decrypted and it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, A transmission means which is the same as or different from the 1st audio code translation transmitting means in some packet data chosen as packet data accommodative in accordance with character or a rule defined beforehand of all the packet data obtained by carrying out compression encoding or input audios is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), c) In accordance with a zone which can be used for the 1st thru/or each Mth transmission line, a compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line. The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, It has a selecting means to which a compression ratio chooses and outputs the lowest coding packet data out of packet data of the same frame which received N coded data from a selected transmission line, and there was no transmission error, or there is no lack and were received.

[0032]

[Mode for carrying out the invention]An embodiment of the invention is described. In a 1st embodiment of this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Some frames which inputted compressed coded data and were chosen accommodative in accordance with

character or a rule defined beforehand of all the frames or input audios, The 1st audio code translation transmitting means (102 of drawing 1) that performs control which transmits using a predetermined transmission means, b) Decrypt inputted coded data, and carry out compression encoding so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, Some frames selected in accordance with character or a rule defined beforehand of all the frames of obtained coded data, or input audios accommodative, Transmission means same as or different from the 1st audio code translation transmitting means is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means (104, 105, 106 of drawing 1) of the Nth individual (N-1), c) Choose a compression ratio of at least one coding of the 1st thru/or Nth audio code translation transmitting means in accordance with a zone which can be used for the 1st thru/or each Mth transmission line, It has a means to send out to the 1st thru/or the Mth transmission line.

[0033]A means by which the code translation receiving set side chooses at least one transmission line from a d M piece transmission line (107 of drawing 1), The coded data which received N coded data from the selected transmission line, and there is no transmission error, and there is no lack, and was received was extracted, and it has a means (112 of drawing 1) by which a compression ratio chooses and outputs the lowest audio coded data out of the coded data of the same frame. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0034]

[Working example]Next, this embodiment is described with reference to Drawings about the 1st working example of this invention that it should explain still in detail.

[0035](1.A) An outline : drawing 1 is a figure showing composition of the 1st working example of this invention. As shown in drawing 1, it comprises the transmission line 130 for transmitting the code translation transmission equipment 100 of audio information, the code translation receiving set 120 of audio information, and coded data. The integer N expresses the number of coded data which code translation transmission equipment sends out, and makes it two or more. The integer M expresses the number of the transmission line 130 where N coded data is transmitted, and makes it one or more.

[0036]The code translation transmission equipment 100 inputs audio information coded with audio encoding equipment (not shown), codes inputted audio information to N coded data, and sends it out to the 1st thru/or the Mth transmission line as the 1st thru/or the Nth audio coded data. As shown in drawing 1, this equipment 110 is provided with the 1st thru/or Nth N audio code translation transmission section 102-106 which sends out to the 1st thru/or Mth M

transmission line.

[0037]As shown in drawing 1, this code translation transmission part equipment 100 is provided with the M code translation transmission processing parts 1 - M corresponding to the 1st thru/or the Mth transmission line 130. The code translation transmission processing part 1 - M send out coded data to the 1st thru/or Mth M transmission line 130 corresponding to each.

[0038]The code translation transmission processing part 1 - M are provided with the 1st thru/or Nth N audio code translation transmission section 102, 104-106.

The 1st thru/or the Nth audio stream are outputted.

The code translation transmission processing part 2 - M have inputted in common the audio coded data once received by the code translation transmission processing part 1, and also are considered as the same composition as the code translation transmission processing part 1.

Since it is easy, only the composition of the code translation transmission processing part 1 is shown in drawing 1. Below, the code translation transmission processing part 1 is explained, and explanation of the code translation transmission processing part 2 - M is omitted.

[0039]The audio information receive section 101 of the code translation transmission processing part 1 receives audio coded data. The audio coded data received in the audio information receive section 101 of the code translation transmission processing part 1 is supplied also to the code translation transmission processing part 2 - M.

[0040]The 1st audio code translation transmission section 102 sends out all or a part of frame of the inputted audio information to the code translation receiving set 120.

[0041]By the audio information decoding section 103, the inputted audio information is decrypted and the 2nd audio code translation transmission section 104, Predetermined compression encoding is performed for obtained Audie with a compression ratio higher than it equivalent to the 1st audio stream or, and coded data is sent out to the code translation receiving set 120.

[0042]When N is three or more, the 3rd thru/or Nth audio code translation transmission section 105 thru/or 106, The coded data obtained by coding all or a part of frames of a frame coded in the 1st audio code translation transmission section 102 with a compression ratio higher than it equivalent to the 2nd audio code translation transmission section 104 or is transmitted to the code translation receiving set 120. The 1st thru/or the Nth audio stream are sent out on the 1st thru/or the Mth transmission line 130.

[0043]The 1st of the code translation transmission processing part 1 - M thru/or the Nth audio information stream are transmitted to up to the 1st thru/or the Mth transmission line 130. It is good also as composition controlled so that a compression ratio of the 2nd thru/or Nth audio code translation transmission section 104-106 is chosen in accordance with a zone which can be used for transmission of audio information in each transmission line 130. Thus, an output of the 2nd thru/or Nth audio code translation transmission section 104-106 by which the 1st

output and compression ratio of the audio code translation transmission section 102 were controlled outputs to the 1st thru/or the Mth transmission line 130. According to this this example, transmission in alignment with an intention of a state of a transmission line or an audio information sending person can be performed.

[0044] Instead of the code translation transmission processing part 1 - M installing more than one side by side, it may be made to distribute the 1st of the one code translation transmission processing part 1 thru/or an output of the Nth audio code translation transmission section to the 1st thru/or the Mth transmission line 130. The code translation transmission processing part 1 - an output route of M may be changed, and connection of the 1st thru/or the Mth transmission line 130 may be made.

[0045] The code translation receiving set 120 is the receiving transmission-line selecting part 107, receives N coded data from a transmission line which chose at least one transmission line and was chosen from the M transmission lines 130 which the code translation transmission equipment 100 transmitted, and performs decoding conversion.

[0046] The 1st thru/or the Nth coded data receive section 108-111 which receive coded data transmitted by the 1st thru/or Nth audio code translation transmission section 102-106 with which the code translation transmission equipment 100 is provided as the code translation receiving set 120 was shown in drawing 1, It has the coded data reconstruction section 112.

[0047] The coded data reconstruction section 112 chooses and outputs data with the lowest compression ratio, for example out of a maximum of N coded data which neither a transmission error nor lack has and was received in the coded data receive sections 108-111.

[0048] Thus, code translation transmission equipment which sends out audio information coded with the audio encoding equipment which is not illustrated in this example, It has the data receiving means 101 from audio encoding equipment, and audio information is changed into N coded data, and it sends out, vacating a time interval which changes each uniformly or accommodative mutually on M transmission lines. The 2nd thru/or Nth audio code translation transmitting means (the 1st thru/or Nth audio code translation transmission section) 104-106 codes a frame coded by the 1st conversion transmitting means 102 with a compression ratio higher than it equivalent to the 1st compression encoding or. A receiver chooses a transmission line by the selecting part 107, is the code data reconstruction section 112, and chooses and decrypts good coded data of tone quality with the lowest compression ratio by frame or a packet unit out of coded data received normally. It explains to details below.

[0049] (1.B) Code translation transmission equipment : drawing 2 shows detailed composition of audio code translation transmission equipment in the 1st working example of this invention. Since it is easy, the number M of a transmission line which sends out 3 and coded data for the number N of coded data which this equipment outputs is set to 2. In drawing 2, the 1st audio code translation transmission section 200 is equivalent to the 1st audio code translation

transmission section 102 of drawing 1.

The 2nd audio code translation transmission section 220 is equivalent to the 2nd audio code translation transmission section 104 of drawing 1, and the decoding section 203, Corresponding to the audio information decoding section 103 of drawing 1, the 3rd audio code translation transmission section 230 is equivalent to the 3rd audio code translation transmission section 105 of drawing 1.

[0050]In the 1st audio code translation transmission section 200, the 1st transmission frame / packet selecting part 201 are selecting parts which choose a frame which sends out an inputted audio frame accommodative according to character of audio information of the input audios, or a situation of a transmission line. In choosing a frame accommodative, character of audio information. (For example, a parameter of an audio signal which affects tone quality, an owner sound / silent exception etc.) A rule for determining whether sort out a frame based on situations (for example, transmission error generation state etc.) of a transmission line is beforehand memorized to a memory measure, It may be made for the 1st transmission frame / packet selecting part 201 to sort out a frame dynamically at any time with reference to this rule based on a comparison result with an analysis result (or transmission situation) of audio information. In the transmission frame / packet selecting part in other working example described below, also when choosing a frame/packet accommodative (dynamic) based on a rule, a frame/packet can be chosen with reference to such a rule. It becomes a standard of selection of a frame/packet, and, as for a rule, it is needless to say that it is good also as composition changed dynamically.

[0051]The 1st error detecting code and frame / packet identification number adjunct 202 add an error detecting code, and a frame / packet identification number for a receiving set to detect a transmission error and packet loss of coding packet data which were outputted, and the 1st audio coded data is outputted.

[0052]In drawing 2, the decoding section 203 decrypts inputted audio coded data in the 2nd audio code translation transmission section 220.

[0053]The 2nd compression encoding part 206 carries out compression encoding of the decode data obtained by the decoding section 203 by a predetermined method.

[0054]The 2nd encoded packet generation part 207 carries out variable length coding of the compressed data obtained by the 2nd compression encoding part 206 to a bit string, and outputs it by a predetermined packet unit.

[0055]The 2nd error detecting code and frame / packet identification number adjunct 208, An error detecting code, and a frame / packet identification number for a receiving set to detect a transmission error and packet loss of coding packet data which the 2nd encoded packet generation part 207 outputted is added, and the 2nd audio coded data is outputted.

[0056]In the 3rd audio code translation transmission section 230, the 3rd compression encoding part 212 codes audio information obtained by the decoding section 203 with a compression ratio higher than it equivalent to the 2nd compression encoding part 206 or.

[0057]The 3rd encoded packet generation part 213 carries out variable length coding of the compressed data obtained by the 3rd compression encoding part 212 to a bit string, and outputs it by a predetermined packet unit.

[0058]The 3rd error detecting code addition and frame / packet identification number adjunct 214, An error detecting code, and a frame / packet identification number for a receiving set to detect a transmission error and packet loss of compression packet data which the 3rd encoded packet generation part 213 outputted is added, the 3rd audio coded data is outputted, and it is transmitted by predetermined transmitting means by a packet unit.

[0059]In this example, since M is set to 2 and N is set to 3, the more than 1st thru/or 3rd audio code translation send data is transmitted to each two transmission line.

[0060]in this example -- the [the 2nd -] -- a coded data output of N may transmit independently, opening the 1st coded data output and a time interval -- it carries out, or the 2nd - the Nth coded data may be multiplexed with the 1st coded data, and it may transmit.

[0061]Although the 1st error detecting code addition and frame / packet identification number adjunct 202 were formed and an error detecting code, and a frame / packet identification number are added to the 1st coded data outputted from the 1st transmission frame / packet selecting part 201, You may not be, as long as such information is already added to inputted audio packet data. As long as it is the method of making it possible to detect a transmission error and packet loss of transmitted coding packet data with a code translation receiving set, you may be what kind of other realization methods. For example, when a mechanism in which transmission error detection is performed in a transmission line of the 1st encoded packet is equipped, there is no necessity of adding error detecting code-ization by the 1st error detecting code addition and frame / packet identification number adjunct 202. If information which can identify a frame and a packet is included in coded data outputted from the 1st transmission frame / packet selecting part 201 as another example, There is no necessity of adding a frame / packet identification number by the 1st error detecting code addition and frame / packet identification number adjunct 202.

[0062]Although similarly the 2nd error detecting code addition and frame / packet identification number adjunct 208 were formed and the error detecting code, and the frame / packet identification number are added to the 2nd coded data, As long as it is the method of making it possible to detect the transmission error and packet loss of the transmitted coded data with a code translation receiving set, you may be what kind of other realization methods.

[0063]Although similarly the 3rd error detecting code addition and frame / packet identification number adjunct 214 were formed and the error detecting code, and the frame / packet

identification number are added to the 3rd coded data, As long as it is the method of making it possible to detect the transmission error and packet loss of the transmitted coded data with a code translation receiving set, you may be what kind of other realization methods.

[0064]In the example materialized still more preferably, this example described above. The audio signal which audio code translation transmission equipment was connected to the Internet communication network, and was inputted with the microphone etc., For example, it compresses into the coded data according to an MPEG-4 AAC (Advanced Audio Coding) system, The data transmitted using RTP (Real time Transport Protocol) / UDP (User Datagram Protocol) / IP (Internet Protocol) protocol is inputted.

[0065]In drawing 2, the 2nd compression encoding part 206 and 3rd compression encoding part 212 perform compression processing by MDCT (Modified Discrete Cosine Transform) and quantization. The 3rd compression encoding part 212 is the method of cutting a method of quantizing a MDCT coefficient using a larger quantization parameter than the 2nd compression encoding part 206, and high order MDCT accommodative, It compresses so that a compression ratio of the 3rd coded data becomes higher on a par with a compression ratio of the 1st coded data than it.

[0066]The decoding section 203 performs inverse quantization and reverse MDCT conversion.

[0067]The 2nd encoded packet generation part 207 is coded according to syntax to which a quantization MDCT coefficient etc. which are outputted from the 2nd compression encoding part 206 were specified by MPEG-4AAC.

[0068]Similarly, the 3rd encoded packet generation part 213 is coded according to syntax to which a quantization MDCT coefficient etc. which are outputted from the 3rd compression encoding part 212 were specified by MPEG-4 AAC.

[0069]The 1st error detecting code addition and frame / packet identification number adjunct 202, The 2nd error detecting code addition and frame / packet identification number adjunct 208, and the 3rd error detecting code addition and frame / packet identification number adjunct 214, UDP datagram having contained a checksum for error detection is created, and it sends out to a code translation receiving set connected to the Internet.

[0070](1.C) A code translation receiving set : drawing 3 shows detailed composition of the audio code translation receiving set 120 in the 1st working example of this invention shown in drawing 1. If drawing 3 is referred to, an audio code translation receiving set is provided with the transmission-line selecting part 300, the 1st thru/or 3rd coded data receive section 320-340, and the coded data reconstruction section 310.

[0071]The transmission-line selecting part 300 chooses a transmission line where a coding conversion receiving set receives audio information.

[0072]In the 1st coded data receive section 320, the 1st packet receive buffer 301 receives the

1st coding packet data transmitted from code translation transmission equipment. The 1st coded data extraction part 302 extracts audio coded data from packet data received by the 1st packet receive buffer 301. The 1st error / packet loss primary detecting element 303 detect a bit error and/or packet loss which were generated at the time of transmission of the 1st coding packet data.

[0073]In the 2nd coded data receive section 330, the 2nd packet receive buffer 304 receives the 2nd coding packet data transmitted from code translation transmission equipment. The 2nd coded data extraction part 305 extracts audio coded data from packet data received by the 2nd packet receive buffer 304. The 2nd error / packet loss primary detecting element 306 detect a bit error and/or packet loss which were generated at the time of transmission of the 2nd coding packet data.

[0074]In the 3rd coded data receive section 340, the 3rd packet receive buffer 307 receives the 3rd coding packet data transmitted from code translation transmission equipment. The 3rd coded data extraction part 308 extracts audio coded data from packet data received by the 3rd packet receive buffer 307. The 3rd error / packet loss primary detecting element 309 detect a bit error and/or packet loss which were generated at the time of transmission of the 3rd coding packet data.

[0075]The coded data reconstruction section 310 The 1st error / packet loss primary detecting element 303, Two coded data transmitted from code translation transmission equipment in the 2nd error / packet loss primary detecting element 306, and the 3rd error / packet loss primary detecting element 309 according to a result of having detected an error and/or packet loss is reconstructed in one coded data.

[0076]A coded data reconstruction procedure in the coded data reconstruction section 310 in this example is explained based on a flow chart of drawing 4. A series of procedures of drawing 4 show the n-th-frame coded data reconstruction processing to a certain integer n.

[0077]In Step S401, it progresses to Step S402, after standing by till time which added predetermined maximum delay time permitted to time when all the coded data of the n-th frame should reach the 1st receiving packet buffer 301 and the 2nd receiving packet buffer 304.

[0078]In Step S402, it is judged in the 1st receiving packet buffer 301 whether there is neither packet loss nor a bit error in the n-th frame data according to a detection result of an error and packet loss in the 1st error detection and packet loss primary detecting element 303. When coded data of the n-th frame is received [no] by the 1st receiving packet buffer 301 and an error is detected by data, it progresses to Step S403, and when other, it progresses to Step S404.

[0079]When it progresses to Step S403, coded data of the n-th frame which the 1st coded data extraction part 302 outputs is outputted, and coded data reconstruction processing is ended.

[0080]When it progresses to Step S404, according to a detection result of an error and packet loss in the 2nd error detection and packet loss primary detecting element 306, it is judged in the 2nd receiving packet buffer 304 whether there is neither packet loss nor a bit error in the n-th frame data. When coded data of the n-th frame is received [no] by the 2nd receiving packet buffer 304 and an error is detected by data, it progresses to Step S405. When other, it progresses to Step S406.

[0081]When it progresses to Step S406, a mistake can be made in setting to the 3rd error detection and packet loss primary detecting element 309, and it is judged in the 2nd receiving packet buffer 304 whether there is neither packet loss nor a bit error in the n-th frame data according to a detection result of packet loss. When coded data of the n-th frame is received [no] by the 3rd receiving packet buffer 307 and an error is detected by data, it progresses to Step S407. When other, it progresses to Step S403.

[0082]In Step S407, coded data of the n-th frame which the 3rd coded data extraction part 308 outputs is outputted as coded data to decrypt, and coded data reconstruction processing is ended.

[0083]The above is a coded data reconstruction procedure in the coded data reconstruction section 310.

[0084]What kind of method may a method of detecting the 1st transmission error and/or error packet loss of coded data in the 1st error detection / packet loss primary detecting element 303 be in this example? For example, it may detect from an error detecting code, and the frame/packet number added with code translation transmission equipment of this example. Or when a transmission line of coded data is equipped with an error detection function, the detection result may be used. When information which specifies a coded frame is included in coded data, information included in coded data may be used.

[0085]Similarly, what kind of method may be sufficient as a method of detecting the 2nd transmission error and/or error packet loss of coded data in the 2nd error detection / packet loss primary detecting element 306?

[0086]Similarly, what kind of method may be sufficient as a method of detecting the 3rd transmission error and/or error packet loss of coded data in the 3rd error detection / packet loss primary detecting element 309?

[0087]In the coded data reconstruction procedure in the coded data reconstruction section 310, as long as the method of standing by the n-th-frame coding data receiving at Step S401 is a way packet loss is detectable, suppressing packet transmission delay within the limits of predetermined, what kind of other methods may be sufficient as it.

[0088]In the coded data reconstruction procedure in the coded data reconstruction section 310, at Step S406. When a transmission error or packet loss is detected by the coded data received by the 3rd receiving packet buffer, about the case where a transmission error or

packet loss occurs, the coded data reconstruction section 310 may perform what kind of other correspondences to the 1st thru/or all the 3rd coded data.

[0089]Although it progresses to Step S403 and is outputting in this example as coded data which decrypts the 1st coded data, For example, the n-th-frame output may be canceled and considering audio information of the ** (n-1) frame outputted before one as the n-th-frame output etc. may correspond by other methods.

[0090]A code translation receiving set is connected to an Internet communication network in one desirable example in which this invention was carried out, The audio coded data which receives the packet data transmitted at another point using RTP/UDP/IP protocol from the code translation transmission equipment connected to the Internet communication network, and is contained in the UDP datagram which received is changed, and it outputs to a decoding machine. Audio coded data follows the MPEG-4 AAC system. The 1st error detection / packet loss primary detecting element 303, the 2nd error detection / packet loss primary detecting element 306, and the 3rd error detection / packet loss primary detecting element 309 are calculating the checksum contained in UDP datagram, and a transmission error is detected.

[0091]In a code translation receiving set, since what is necessary is just to decrypt at least one data out of three received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0092]Transmission forms of coding packet data : (1.D) In this invention. Although the 1st thru/or 2nd coding packet data may be transmitted by code translation receiving set wall or a method of becoming from code translation transmission equipment, in order to heighten an effect of this invention, A way correlation with a bit error and packet loss which are generated in the 1st coding packet data, and a bit error and packet loss which are generated in the 2nd coding packet data that coded the same frame becomes small is desirable. Drawing 5 shows one form of such desirable coding packet data transmission.

[0093]In drawing 5, code translation transmission equipment which 501 explained with reference to drawing 1 and drawing 2, and 502 and 503 A delay adjunct which adds and sends out a time delay which changes uniformly or accommodative to the 2nd and 3rd coding packet data outputted from the code translation transmission equipment 501, and 504, It is a multiplexing part which multiplexes the 1st coded data outputted from the code translation transmission equipment 501, and the 2nd coded data outputted from the delay adjunct 502 and the 3rd coded data outputted from the delay adjunct 503, and a transmission line transmits. 505 is a transmission line which transmits data multiplexed by the delay adjunct 503 to a receiving set from a sending set. Similarly, 508 and 509 are multiplexing parts and transmission lines which perform processing which transmits same data to the 2nd transmission line.

[0094]Here, a time delay added to the 2nd thru/or the 3rd coded data is determined by the

delay adjuncts 502 thru/or 503 by the maximum bust time of a bit error or packet loss generated in the transmission line 505. A delaying amount takes the bit rate, buffer size, etc. into consideration, and is determined. both [which coded the same frame by this even if a burst error occurred in the transmission line 505] the 1st thru/or the 3rd coded data -- although -- since probability of being influenced by error becomes small, it is possible to lessen generating of degradation of remarkable tone quality by loss of frame coded data. The maximum bust time of packet loss is determined by survey etc., and delay set up by a delay adjunct is set up based on buffer size of a receiving set, and a transfer rate (bit rate) of a transmission line.

[0095]Similarly, a time delay added to the 2nd thru/or the 3rd coded data by the delay adjuncts 506 and 507 is determined by the maximum bust time of a bit error or packet loss generated in the transmission line 509. both [which coded the same frame by this even if a burst error occurred in the transmission line 509] the 1st thru/or the 3rd coded data -- although -- since probability of being influenced by error becomes small, it is possible to lessen generating of degradation of remarkable tone quality by loss of frame coded data. It is good also as composition which provides a delay adjunct or a delay adjunct, and a multiplexing part in the code translation transmission equipment 501.

[0096](1.E) Operation effect : according to the 1st working example, audio code translation transmission equipment changes the same audio information into N coded data (here N= 3), and it transmits, vacating the time interval which changes uniformly or accommodative. In accordance with the character or the rule defined beforehand of an audio, the 1st audio code translation transmission section chooses the inputted frame of audio information accommodative, and outputs it. The 2nd audio code translation transmission section decrypts the inputted audio information, and codes and outputs it with a compression ratio higher than it equivalent to input data or. The 3rd audio code translation transmission section codes the frame coded in the 2nd audio code translation transmission section.

[0097]A compression ratio chooses the low good coded data of tone quality per frame from the coded data which received the data from at least one transmission line among M transmission lines, and has been received normally, and the code translation receiving set side outputs.

[0098]as a result -- the case where the unreliable transmission line where the high transmission error and packet loss of burst nature occur frequently is used -- any of N coded data -- although -- it is possible to prevent the probability transmitted accidentally becoming small and remarkable degradation arising in the decoding tone quality after transmission.

[0099]Increase of a transmission band accompanying these coded data transmission can be small suppressed by making high a compression ratio of the 2nd thru/or the 3rd coded data.

[0100]In addition, in accordance with a zone which can be used, the 1st thru/or the 3rd coded data can be transmitted to several transmission lines where zones differed, and influence of an

error in a transmission line can be reduced further.

[0101]In this example, although it is used combining code translation transmission equipment and a code translation receiving set, it may be used independently, respectively. The 1st thru/or Nth code translation data may SHAFURU and multiplex packet order by the interleave method etc.

[0102][A 2nd embodiment] in a 2nd embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, Input compressed coding packet data and a) All the packets, Or the 1st audio code translation transmitting means that performs control which transmits some packets selected in accordance with character or a rule defined beforehand of an input audio accommodative using a predetermined transmission means, b) Decrypt inputted coding packet data, and carry out compression encoding so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, A transmission means which is the same as or different from the 1st audio code translation transmitting means in some packet data selected in accordance with character or a rule defined beforehand of all the obtained packet data or input audios accommodative is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), c) In accordance with a zone which can be used for the 1st thru/or each Mth transmission line, a compression ratio of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line.

[0103]The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, It has a selecting means to which a compression ratio chooses and outputs the lowest coding packet data out of packet data which received N coded data from a selected transmission line, and there is no transmission error, and there is no lack, and were received. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0104][The 2nd working example] The 2nd working example of this invention is described that it should explain still in detail about a 2nd embodiment of this invention below.

[0105](2.A) An outline : composition and operation of this example are almost the same as the 1st working example, and as shown in drawing 1, they comprise the transmission line 130 for transmitting the code translation transmission equipment 100, the code translation receiving set 120, and coded data. The integer N expresses the number of coded data which code translation transmission equipment transmits, and makes it two or more. The integer M expresses the number of a transmission line where N coded data is sent out, and makes it one

or more.

[0106]Although composition of the code translation transmission equipment 100 is almost the same as said 1st working example, operations of each part which constitutes this equipment differ a little. Hereafter, a point of difference is explained.

[0107]Coded data of an audio of an input frame coded in the 1st audio code translation transmission section (1st audio encoding frame 1 transmission section) 102 comprises a piece or two or more packet data.

Compressed data is coded by each packet data.

The 1st audio stream transmits all or a part of packet of inputted audio information to the code translation receiving set 120.

[0108]The 2nd audio code translation transmission section (2nd audio encoding frame 1 transmission section) 104, Predetermined compression encoding is performed for audio information obtained by decrypting inputted audio information with a compression ratio higher than it equivalent to the 1st audio stream or, and coded data is transmitted to the code translation receiving set 120.

[0109]The 3rd thru/or Nth audio code translation transmission section 105 and 106, Coding packet data obtained by coding all or a part of packets of a packet coded in the 2nd audio code translation-ized transmission section with a compression ratio higher than it equivalent to the 2nd audio code translation transmission section or are transmitted to the code translation receiving set 120. About operations other than the above, it is the same as said 1st working example fundamentally. Also in this 2nd working example, it is good also as composition which has a compression ratio of the 2nd thru/or Nth audio code translation transmission section 104-106 chosen in accordance with a zone which can be used for transmission of audio information in each transmission line 130. An output of the 1st thru/or Nth audio code translation transmission section 102, 104-106 outputs to the 1st thru/or the Mth transmission line 130. According to this this example, transmission in alignment with an intention of a state of a transmission line or an audio information sending person can be performed.

[0110]Although composition of the code translation receiving set 120 is almost the same as said 1st working example, operations of each part which constitutes this equipment differ a little. A point of difference is explained below.

[0111]Like the 1st working example, the coded data reconstruction section 112 does not have a transmission error or lack, and is received in the 1st thru/or Nth coded data receive section, It chooses as coded data which has a packet with the lowest compression ratio decrypted from a maximum of N coding packet data containing compressed data of the same field of the same frame, and this selection is performed in a packet-data unit which code translation transmission equipment transmits. About operations other than the above, it is fundamentally the same as the 1st working example.

[0112]Code translation transmission equipment : (2.B) Composition and operation of code translation transmission equipment in this example, The 1st encoded packet selecting part [in / it is almost the same as code translation transmission equipment in the 1st working example shown in drawing 2, and / drawing 2] 201, The 2nd encoded packet generation part 207 and the 3rd encoded packet generation part 213, Only operation with the 1st error detecting code addition and frame / packet number adjunct 202, the 2nd error detecting code addition and frame / packet number adjunct 208, and the 3rd error detecting code addition and frame / packet number adjunct 214 is different. A point of difference is explained below.

[0113]The 1st error detecting code addition and frame / packet number adjunct 202, The 2nd error detecting code addition and frame / packet number adjunct 208, and the 3rd error detecting code addition and frame / packet number adjunct 214 operate so that the same packet identification number may be added to coding packet data of the same frame. Operation of treating parts other than the above is the same as that of the 1st working example.

(2.C) A code translation receiving set : composition and operation of an audio code translation receiving set in this example are almost the same as an audio code translation receiving set in the 1st working example shown in drawing 3, and only operation of the coded data reconstruction section 310 in drawing 3 is different. A point of difference is explained below.

[0114]A procedure of coded data reconstruction by the coded data reconstruction section 310 in this example is explained based on a flow chart of drawing 6. A series of procedures of drawing 6 show the n-th-frame coded data reconstruction processing to a certain integer n.

[0115]In Step S601, all the coded data of the n-th frame The 1st receiving packet buffer 301, It progresses to Step S602, after standing by till the time which added the predetermined maximum delay time permitted to the time which should reach the 2nd receiving packet buffer 304 and the 3rd receiving packet buffer 307.

[0116]In Step S602, the minimum of the packet number of the n-th frame is stored in the variable a which memorizes a packet number, and the maximum of the packet number of the n-th frame is stored in the variable b.

[0117]In Step S603, the value of the variable a is assigned to the variable i which memorizes a packet number, and the repetition processing from Step S604 is started.

[0118]In Step S604, according to the detection result of an error and packet loss in the 1st error detection and packet loss primary detecting element 303, the i-th packet exists in the 1st receiving packet buffer 301, and it is judged whether there is any bit error. When the i-th packet of the n-th frame is received by the 1st receiving packet buffer 301 and an error is not detected by data, it progresses to Step S605. When other, it progresses to Step S606.

[0119]When it progresses to Step S605, the coded data of the n-th frame which the 1st coded data extraction part 302 outputs is outputted as coded data to decrypt, and it progresses to

Step S610.

[0120]When it progresses to Step S606, according to a detection result of an error and packet loss in the 2nd error detection and packet loss primary detecting element 306, the i -th packet exists in the 2nd receiving packet buffer 304, and it is judged whether there is any bit error.

When the i -th packet of the n -th frame is received by the 2nd receiving packet buffer 304 and an error is not detected by data, it progresses to Step S607. When other, it progresses to Step S608.

[0121]In Step S607, coded data of the n -th frame which the 2nd coded data extraction part 305 outputs is outputted as coded data to decrypt, and it progresses to Step S610.

[0122]When it progresses to Step S608, according to a detection result of an error and packet loss in the 3rd error detection and packet loss primary detecting element 309, the i -th packet exists in the 3rd receiving packet buffer 307, and it is judged whether there is any bit error.

When the i -th packet of the n -th frame is received by the 3rd receiving packet buffer 307 and an error is not detected by data, it progresses to Step S609. When other, it progresses to Step S610.

[0123]The variable i is made to increase one time in Step S610. In continuing Step S611, it judges whether the variable i is over a value of the variable b , and when not having exceeded, processing from Step S604 is repeated.

[0124]At Step S610, when the variable i is over a value of the variable b , a series of repetition processings are finished and reconstruction processing of the n -th frame coded data is ended.

[0125]The above is operation of the coded data reconstruction section 310 in this example. A method of standing by reception of the n -th frame coded data at Step S601 in a coded data reconstruction procedure in the coded data reconstruction section 310 of this example, As long as it is the way packet loss is detectable, suppressing packet transmission delay within the limits of predetermined, what kind of other methods may be used.

[0126](2.D) A operation effect : according to the 2nd working example, audio code translation transmission equipment codes the same audio information to N coded data (here $N = 3$), and it transmits, vacating a time interval which changes uniformly or accommodative.

[0127]The 2nd thru/or 3rd audio code translation transmitting means codes a field containing a packet changed by the 1st audio code translation transmitting means.

[0128]The code translation receiving set side chooses and decrypts good coded data of tone quality with a low compression ratio by a packet unit out of coded data received normally.

[0129]as a result -- the case where the unreliable transmission line where the high transmission error and packet loss of burst nature occur frequently is used -- any of three coded data -- although -- it is possible to prevent the probability transmitted accidentally becoming small and remarkable degradation arising in the decoding tone quality after transmission.

[0130] Increase of the transmission band accompanying these coded data transmission can be small suppressed by making high the compression ratio of the 2nd thru/or the 3rd coded data.

[0131] In accordance with the zone which can be used, the 1st thru/or the 3rd coded data can be transmitted to several transmission lines where zones differed, and the influence of the error in a transmission line can be reduced further. In a code translation receiving set, since what is necessary is to decrypt only one piece out of three received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0132] In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory.

[0133] [A 3rd embodiment] in a 3rd embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Some frames which inputted the compressed coded data and were chosen accommodative in accordance with the character or the rule defined beforehand of all the frames or input audios, The 1st audio code translation transmitting means that carries out compression encoding and performs control which transmits the obtained coded data using a predetermined transmission means so that it may become a compression ratio higher than it equivalent to the inputted audio information or, b) All the frames which said 1st audio code translation transmitting means coded, Or some frames selected in accordance with the character or the rule defined beforehand of an input audio accommodative, It codes so that it may become a compression ratio higher than it equivalent to the 1st audio code translation transmitting means or, The transmission means which is the same as or different from the 1st audio code translation transmitting means in the obtained coded data is used, The 2nd which performs control which places the time interval which changes uniformly or accommodative, and transmits thru/or the audio code translation transmitting means of the Nth individual (N-1), and c) It unites with the zone which can be used for the 1st thru/or each Mth transmission line, The compression ratio of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line.

[0134] The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, Coded data which received N coded data from a selected transmission line, and there is no transmission error, and there is no lack, and was received was extracted, and it has a means by which a compression ratio chooses and outputs the lowest audio coded data out of coded data of the same frame. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0135][The 3rd working example] It explains being based on the 3rd working example of this invention, and referring to Drawings that it should explain still in detail about this embodiment below.

[0136](3.A) An outline : drawing 7 is a figure showing composition of the 3rd working example of this invention. As shown in drawing 7, it comprises the transmission line 730 for transmitting the code translation transmission equipment (it is also called "audio code translation transmission equipment") 700, the code translation receiving set (it is also called an "audio code translation receiving set") 720, and coded data of audio information. The integer N expresses the number of coded data which the code translation transmission equipment 700 transmits. N uses two or more. The integer M expresses the number of a transmission line where N coded data is sent out, and makes it one or more.

[0137]The audio code translation transmission equipment 700 performs predetermined compression encoding for the audio information obtained by decrypting the inputted audio information which was coded with a compression ratio higher than it equivalent to input data or, and transmits code translation data to the audio code translation receiving set 720. The inputted audio information is coded to N coded data, and it transmits to the 1st thru/or the Mth transmission line as the 1st thru/or the Nth audio coded data. As shown in drawing 7, this equipment has the code translation treating part 1 - the code translation treating part N, and each code translation treating part is provided with the 1st thru/or Nth N audio code translation transmission section (the 1st thru/or Nth audio code translation transmission section) 703, 704, and 705.

[0138]The audio information receive section 701 receives audio information.

[0139]The audio information decoding section 702 decrypts the inputted audio coded data.

[0140]The 1st audio code translation transmission section 703 transmits the coded data obtained by performing predetermined compression encoding to the frame inputted into code translation transmission equipment to the audio code translation receiving set 720.

[0141]The 2nd thru/or Nth audio code translation transmission section 704 thru/or 705, Coded data obtained by coding all or a part of frames of a frame coded in the 1st audio code translation transmission section 703 with a compression ratio higher than it equivalent to the 1st audio code translation transmission section 703 or is transmitted to the audio code translation receiving set 720. The 1st thru/or the Nth audio stream are transmitted to up to the 1st thru/or the Mth transmission line 730. It is good also as composition controlled so that a compression ratio of coding of the 1st thru/or Nth audio code translation transmission section 703-705 is chosen in accordance with a zone which can be used for transmission of audio information in each transmission line 730. An output of the 1st thru/or Nth audio code translation transmission section 703-705 by which a compression ratio of coding was controlled is considered as composition outputted to the 1st thru/or the Mth transmission line

730, and transmission in alignment with an intention of a state of a transmission line or an audio information sending person can be performed.

[0142]The audio code translation receiving set 720 is the receiving transmission-line selecting part 706, receives N coded data from a transmission line which chose at least one transmission line and was chosen from M transmission lines which audio code translation transmission equipment transmitted, and performs decoding conversion.

[0143]As shown in drawing 7, the audio code translation receiving set 720, It has the 1st thru/or Nth coded data receive section 707 thru/or 709 which receives the coded data transmitted by the 1st thru/or audio encoding frame of ** Nth 1 transmission sections 703-705 with which the code translation transmission equipment 700 is provided, and the coded data reconstruction section 710.

[0144]The coded data reconstruction section 710 chooses and outputs data with the lowest compression ratio out of a maximum of N coded data which neither a transmission error nor lack has and was received in the coded data receive sections 707 thru/or 709.

[0145](3.B) Code translation transmission equipment : drawing 8 shows the detailed composition of the audio code translation transmission equipment in the 3rd working example of this invention. Since it is easy, the number M of the transmission line which transmits 2 and coded data for the number N of the coded data which this equipment outputs is set to 2. The composition which consists of the 1st audio code translation transmission section 703 of drawing 7 and the 2nd audio code translation transmission section 704 is supported.

[0146]In drawing 8, the 1st audio encoding conversion transmission section 800, The decoding section 801 which decrypts inputted audio information, and the 1st compression encoding part 804 that carries out compression encoding, The 1st encoded packet generation part 805 that carries out variable length coding of the compressed data obtained by the 1st compression encoding part 804 to a bit string, and is outputted by a predetermined packet unit, In order for a receiving set to detect a transmission error and packet loss of coding packet data which the 1st encoded packet generation part 805 outputted, It has the 1st error detecting code and frame / packet identification number adjunct 806 that adds an error detecting code, and a frame / packet identification number, and the 1st audio encoding data packet is transmitted by predetermined transmitting means by a packet unit.

[0147]In drawing 8, the 2nd audio encoding conversion transmission section 820 (it corresponds to the 2nd audio code translation transmission section 704), The 2nd compression encoding part 810 coded with a compression ratio higher than it equivalent to the 1st compression encoding part 804 or, The 2nd encoded packet generation part 811 that carries out variable length coding of the compressed data obtained by the 2nd compression encoding part 810 to a bit string, and is outputted by a predetermined packet unit, In order for a receiving set to detect a transmission error and packet loss of compression packet data which

the 2nd encoded packet generation part 811 outputted, It has the 2nd the error detecting code addition and frame / packet identification number adjunct 812 that adds an error detecting code, and a frame / packet identification number, and the 2nd audio encoding data packet is transmitted by predetermined transmitting means by a packet unit.

[0148]In this example, since M is set to 2 and N is set to 2, the more than 1st thru/or 2nd audio code translation transmission data packet is transmitted to each two transmission line.

[0149]Although the 1st error detecting code addition and frame / packet identification number adjunct 806 were formed and an error detecting code, and a frame / packet identification number are added to the 1st coding packet data outputted from the 1st encoded packet generation part 805 in this example, As long as it is the method of making it possible to detect a transmission error and packet loss of transmitted coding packet data with a code translation receiving set, you may be what kind of other realization methods. For example, when a mechanism in which transmission error detection is performed in a transmission line of the 1st encoded packet is equipped, there is no necessity of adding error detecting code-ization by the 1st error detecting code and frame / packet identification number adjunct 806. If information which can identify a frame and a packet is included in coded data outputted from the 1st encoded packet generation part 805 as another example, there will be no necessity of adding a frame / packet identification number by the 1st error detecting code and frame / packet identification number adjunct 806.

[0150]Although similarly the 2nd error detecting code addition and frame / packet identification number adjunct 812 were formed and an error detecting code, and a frame / packet identification number are added to the 2nd coding packet data, As long as it is the method of making it possible to detect a transmission error and packet loss of transmitted coding packet data with a code translation receiving set, you may be what kind of other realization methods.

[0151]The example which materialized still more preferably this example described above is the same as that of the 1st working example of invention.

[0152](3.C) Code translation receiving set : the audio code translation receiving set (720 of drawing 7) in the 3rd working example of this invention is the same as that of the composition shown in drawing 3. However, although the number M of the transmission line is set to 3 in drawing 3, since it is M=2 in this example, the 3rd coded data receive section 340 (refer to drawing 3) of a code translation receiving set does not exist by this example. Since M is 2, operation of the coded data reconstruction section 310 is different from what the procedure showed to drawing 3.

[0153]Operation procedures in the coded data reconstruction section 310 in this example are explained based on a flow chart of drawing 9. A series of procedures of drawing 9 show the n-th-frame coded data reconstruction processing to a certain integer n.

[0154]In Step S901, it progresses to Step S902, after standing by till time which added

predetermined maximum delay time permitted to time when all the coded data of the n-th frame should reach the 1st receiving packet buffer 301 and the 2nd receiving packet buffer 304 (refer to drawing 3).

[0155]In Step S902, it is judged whether there is neither packet loss nor a bit error in the n-th frame data in the 1st receiving packet buffer 301 according to a detection result of an error and packet loss in the 1st error detection and packet loss primary detecting element 303. When coded data of the n-th frame is received [no] by the 1st receiving packet buffer 301 and an error is detected by data, it progresses to Step S903. When other, it progresses to Step S904.

[0156]When it progresses to Step S903, coded data of the n-th frame which the 1st coded data extraction part 302 outputs, It delivers to a variable-length decoding section (in drawing 3, it corresponds to a decoding device of, for example, drawing 15, which is not illustrated) as coded data to decrypt, and coded data reconstruction processing is ended.

[0157]When it progresses to Step S904, according to a detection result of an error and packet loss in the 2nd error detection and packet loss primary detecting element 306, it is judged whether there is neither packet loss nor a bit error in the n-th frame data in the 2nd receiving packet buffer 304. When coded data of the n-th frame is received [no] by the 2nd receiving packet buffer 304 and an error is detected by data, it progresses to Step S905. When other, it progresses to Step S903.

[0158]In Step S905, coded data of the n-th frame which the 2nd coded data extraction part 305 outputs is delivered to a variable-length decoding section (in drawing 3, it corresponds to a decoding device of, for example, drawing 15, which is not illustrated) as coded data to decrypt, and coded data reconstruction processing is ended.

[0159]Operation of each part other than [in this example] this and a desirable example are the same as the 1st working example.

[0160](3.D) A operation effect : according to the 3rd working example described above, audio code translation transmission equipment decrypts inputted audio information, and it transmits, vacating a time interval which codes to two coded data and changes this uniformly or accommodative in the same audio information.

[0161]The 2nd audio encoding transmitting means codes a frame coded by the 1st audio encoding transmitting means.

[0162]Out of coded data received normally, a compression ratio chooses low good coded data of tone quality per frame, and outputs the code translation receiving set side. As a result, even when using an unreliable transmission line where a high transmission error and packet loss of burst nature occur frequently, it is possible to prevent probability that both two coded data will be transmitted accidentally becoming small, and remarkable degradation arising in decoding tone quality after transmission.

[0163]Increase of a transmission band accompanying the 2nd coded data transmission can be

small suppressed by making a compression ratio of the 2nd coded data high. In addition, by intention of a situation of a transmission line, an audio sending person, or an audio addressee, the 1st thru/or the 2nd coded data can be transmitted to several transmission lines where zones differed, and influence of an error in a transmission line can be reduced further.

[0164]In a code translation receiving set, since what is necessary is just to decrypt at least one data out of two received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0165]In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory. The 1st thru/or Nth code translation data may be arranged using interleave.

[0166][A 4th embodiment] in a 4th embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Carry out compression encoding so that inputted coding packet data may be decrypted and it may become a compression ratio higher than it equivalent to inputted audio information or, The 1st audio code translation transmitting means that performs control which transmits a piece or two or more coding packet data which were obtained using a predetermined transmission means, b) All the packet data which said 1st audio code translation transmitting means coded, Or to some packet data selected in accordance with character or a rule defined beforehand of an input audio accommodative, so that it may become a compression ratio higher than it equivalent to the 1st audio code translation transmitting means or, A transmission means which is the same as or different from the 1st audio code translation transmitting means in coding packet data obtained by coding to packet data including the same field as the packet data concerned is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), and c) It unites with a zone which can be used for the 1st thru/or each Mth transmission line, A compression ratio of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line.

[0167]A code translation receiving set chooses at least one transmission line from a d M piece transmission line, It has a selecting means to which a compression ratio chooses and outputs the lowest coding packet data out of packet data of the same frame which received N coded data from a selected transmission line, and there is no transmission error, and there is no lack, and were received. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0168][The 4th working example] This embodiment is described with reference to Drawings

about the 4th working example of this invention below that it should explain still in detail.

[0169](4.A) An outline : composition and operation of this example are almost the same as the 3rd working example, and as shown in drawing 7, they comprise the transmission line 730 for transmitting the audio code translation transmission equipment 700, the code translation receiving set 720, and coded data. The integer N expresses the number of coded data which code translation transmission equipment transmits, and makes it two or more. The integer M expresses the number of a transmission line where N coded data is sent out, and makes it one or more.

[0170]Although composition of audio code translation transmission equipment is almost the same as said 3rd working example, operations of each part which constitutes this equipment differ a little. Predetermined compression encoding is performed for Audie obtained by decrypting inputted audio coded data with a compression ratio higher than it equivalent to input audio information or, and code translation data is transmitted to an audio code translation receiving set. Coded data of an input frame coded in the 1st audio code translation transmission section 703 comprises one piece or two or more packet data. The 2nd thru/or Nth audio code translation transmission section 704-705, Coding packet data obtained by coding all or a part of packets of a packet coded in the 1st audio code translation transmission section 703 with a compression ratio higher than it equivalent to the 1st audio code translation transmission section 703 or are transmitted to an audio code translation receiving set. About operations other than the above, it is the same as the 3rd working example fundamentally.

[0171]Although composition of an audio code translation receiving set is almost the same as said 3rd working example, operations of each part which constitutes this equipment differ a little. A point of difference is explained below. Like said 3rd working example, the coded data reconstruction section 710 has neither a transmission error nor lack, and is received in the 1st thru/or Nth coded data receive section 707, 708, and 709, It chooses as coded data which has a packet with the lowest compression ratio decrypted from a maximum of N coding packet data containing compressed data of the same field of the same frame, and this selection is performed in a packet-data unit which code translation transmission equipment transmits. About operations other than the above, it is fundamentally the same as the 3rd working example. It unites with a zone which can be used for transmission of audio information in each transmission line 730 also in this working example, It has composition which has a compression ratio of coding of the 1st thru/or Nth audio code translation transmission section 703-705 chosen, An output of the 1st thru/or Nth audio code translation transmission section 703-705 is considered as composition outputted to the 1st thru/or the Mth transmission line 730, and transmission in alignment with an intention of a state of a transmission line or an audio information sending person can be performed.

[0172]Code translation transmission equipment : (4.B) Composition and operation of audio

information code translation transmission equipment in this example, The 1st encoded packet generation part [in / it is almost the same as audio information code translation transmission equipment in said 3rd working example shown in drawing 8 and / drawing 8] 805, Only operation of the 2nd encoded packet generation part 811, the 1st error detecting code addition and frame / packet number adjunct 806, and the 2nd error detecting code addition and frame / packet number adjunct 812 is different. Hereafter, a point of difference of operation is explained.

[0173]That is, in this working example, the 1st error detecting code addition and frame / packet number adjunct 806, and the 2nd error detecting code addition and frame / packet number adjunct 812 operate so that the same packet identification number may be added to coding packet data of the same frame. Operation of treating parts other than the above is the same as that of said 3rd working example.

[0174]The example which materialized still more preferably this example described above is the same as that of the 2nd working example.

[0175](4.C) Code translation receiving set : the composition and operation of an audio code translation receiving set in this example are almost the same as the audio code translation receiving set in the 2nd working example shown in drawing 3. However, although the number M of the transmission line is set to 3 in drawing 3, since it is $M=2$ in this example, the 3rd coding receive section does not exist by this example. Since M is 2, operation of the reconstruction 310 of coded data differs in a procedure.

[0176]The operation procedures in the coded data reconstruction section 310 in this example are explained based on the flow chart of drawing 10. A series of procedures of drawing 10 show the n-th-frame coded data reconstruction processing to a certain integer n.

[0177]In Step S1001, it progresses to Step S1002, after standing by till time which added predetermined maximum delay time permitted to time when all the coded data of the n-th frame should reach the 1st receiving packet buffer 301 and the 2nd receiving packet buffer 304.

[0178]In Step S1002, the minimum of a packet number of the n-th frame is stored in the variable a which memorizes a packet number, and the maximum of a packet number of the n-th frame is stored in the variable b.

[0179]In Step S1003, a value of the variable a is assigned to the variable i which memorizes a packet number, and repetition processing from Step S1004 is started.

[0180]In Step S1004, according to a detection result of an error and packet loss in the 1st error detection and packet loss primary detecting element 303, the i-th packet of the n-th frame exists in the 1st receiving packet buffer 301, and it is judged whether there is any bit error. When the i-th packet of the n-th frame is received by the 1st receiving packet buffer 301 and an error is not detected by data as a result of a judgment of Step S1004, it progresses to Step

S1005. When other, it progresses to Step S1006.

[0181]When it progresses to Step S1005, coded data of the n-th frame which the 1st coded data extraction part 302 outputs is delivered to a variable-length decoding section (it corresponds to a decoding device of, for example, drawing 15, which is not illustrated) as coded data to decrypt, and it progresses to Step S1008.

[0182]When it progresses to Step S1006, according to a detection result of an error and packet loss in the 2nd error detection and packet loss primary detecting element 306, the i-th packet of the n-th frame exists in the 2nd receiving packet buffer 304, and it is judged whether there is any bit error.

[0183]When the i-th packet of the n-th frame is received by the 2nd receiving packet buffer 304 and an error is not detected by data as a result of a judgment of Step S1006, it progresses to Step S1007. When other, it progresses to Step S1008.

[0184]In Step S1007, coded data of the n-th frame which the 2nd coded data extraction part 305 outputs is delivered to a variable-length decoding section (it corresponds to a decoding device of, for example, drawing 15, which is not illustrated) as coded data to decrypt, and it progresses to Step S1008.

[0185]The variable i is made to increase one time in Step S1008. In continuing Step S1009, whether the variable i is over a value of the variable b, and when not having judged and exceeded, processing from Step S1004 is repeated. When the variable i exceeds a value of the variable b, a series of repetition processings are finished and reconstruction processing of the n-th frame coded data is ended.

[0186]Operation of each part other than [in this example] this and a desirable example are the same as the 3rd working example.

[0187](4.D) A operation effect : according to the 4th working example described above, audio code translation transmission equipment decrypts inputted audio information, and it transmits, vacating a time interval which codes to two coded data and changes this uniformly or accommodative in the same audio information.

[0188]The 2nd coding transmitting means codes a packet coded by the 1st coding transmitting means. The code translation receiving set side chooses and outputs good coded data of tone quality with a low compression ratio by a packet unit out of coded data received normally. As a result, even when using an unreliable transmission line where a high transmission error and packet loss of burst nature occur frequently, it is possible to prevent probability that both two coded data will be transmitted accidentally becoming small, and remarkable degradation arising in decoding tone quality after transmission.

[0189]Increase of a transmission band accompanying the 2nd coded data transmission can be small suppressed by making a compression ratio of the 2nd coded data high. In addition, by intention of a situation of a transmission line, an audio sending person, or an audio addressee,

the 1st thru/or the 2nd coded data can be transmitted to several transmission lines where zones differed, and influence of an error in a transmission line can be reduced further.

[0190]In a code translation receiving set, since what is necessary is just to decrypt at least one data out of two received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0191]In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory. Interleave [/ in addition to a time interval] may be sufficient as the 1st thru/or Nth code translation data.

[0192][A 5th embodiment] in a 5th embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) The 1st audio code translation transmitting means that performs control which inputs coding packet data and transmits a packet of one copy using a predetermined transmission means altogether, b) All the packet data which said 1st audio encoding means coded, Or some packet data selected in accordance with character or a rule defined beforehand of an input audio accommodative are received, A transmission means which is the same as or different from the 1st audio code translation transmitting means in packet data obtained by reproducing a packet is used, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), and c) It has a means to send out an output of the 1st thru/or Nth audio code translation transmitting means to the 1st thru/or the Mth transmission line.

[0193]The code translation receiving set side is provided with a selecting means which chooses and outputs coding packet data out of packet data which chose at least one transmission line from a d M piece transmission line, received N coded data from a selected transmission line, and there is no transmission error, and there is no lack, and were received. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0194][The 5th working example] This embodiment is described with reference to Drawings about the 5th working example of this invention below that it should explain still in detail.

[0195](5.A) An outline : drawing 11 shows the 5th working example of this invention. As shown in this figure, it comprises the transmission line 1230 for transmitting the code translation transmission equipment 1200, the code translation receiving set 1220, and coded data of audio information. The integer N expresses the number of coded data which code translation transmission equipment transmits, and makes it two or more. The integer M expresses the

number of a transmission line where N coded data is sent out, and makes it one or more. Code translation transmission equipment inputs audio packet data, chooses the all or part, and sends it out to the 1st thru/or the Mth transmission line.

[0196]As shown in drawing 11, this code translation transmission equipment 1200 is provided with the 1st thru/or Nth N audio code translation transmission section 1202, 1204, and 1205 which performs control which transmits to the 1st thru/or Mth M transmission line 1230. The audio information receive section 1201 receives audio packet data. The 1st audio code translation transmission section 1202 transmits all or a part of packets of inputted audio packet data to the DIO code translation receiving set 1220.

[0197]The audio information duplicate parts 1203 are reproduced to some packet data selected in accordance with character or a rule defined beforehand of all the received packet data or input audios accommodative, and are outputted to the 2nd thru/or Nth audio code translation transmission section 1204 thru/or 1205.

[0198]a packet by which the 2nd audio code translation transmission section 1204 thru/or 1205 was reproduced -- the 1st audio packet data -- the same -- or packet data of the different number are chosen and a part is transmitted to an audio code translation receiving set. The 1st thru/or the Nth audio stream are transmitted to up to the 1st thru/or Mth transmission line.

[0199]The audio code translation receiving set 1220 is the receiving transmission-line selecting part 1206, receives N coded data from a transmission line which chose at least one transmission line and was chosen from M transmission lines which code translation transmission equipment transmitted, and performs decoding conversion.

[0200]As shown in drawing 12, it has the 1st thru/or Nth coded data receive section 1207-1209 which receives coded data transmitted by the 1st thru/or Nth audio code translation transmission section 1202, 1204, and 1205 with which the code translation transmission equipment 1200 is provided, and the coded data reconstruction section 1210.

[0201]The coded data reconstruction section 1210 chooses and outputs data out of a maximum of N coded data which neither a transmission error nor lack has and was received in the coded data receive sections 1207 thru/or 1209.

[0202](5.B) Coding conversion transmission equipment : drawing 12 shows detailed composition of audio code translation transmission equipment in the 5th working example of this invention. Since it is easy, the number M of a transmission line which transmits 2 and coded data for the number N of coded data which this equipment outputs is set to 2. In drawing 12, the 1st audio code translation transmission section 1300, The 1st transmitting packet selecting part 1301 that chooses a packet which transmits accommodative among inputted audio packet data according to character of an audio signal, or a situation of a transmission line, It has the 1st error detecting code and frame / packet identification number adjunct 1302 that adds an error detecting code, and a frame / packet identification number for a receiving

set to detect a transmission error and packet loss of coding packet data which were outputted, and the 1st coded data is outputted.

[0203]In drawing 12, the 2nd audio code translation transmission section 1310, the packet duplicate parts 1303 which reproduce the inputted audio encoding packet data, and the 1st [among the reproduced audio packet data] audio code translation transmission section 1300 - the same -- or with the different number. The 2nd transmitting packet selecting part 1304 that chooses the packet which transmits accommodative to some packet data selected in accordance with the character or the rule defined beforehand of an audio signal accommodative, In order for a receiving set to detect the transmission error and packet loss of coding packet data which the 2nd transmitting packet selecting part 1304 outputted, It has the 2nd error detecting code and frame / packet identification number adjunct 1305 that adds an error detecting code and a packet identification number, and the 2nd coded data is outputted.

[0204]In this example, since M is set to 2 and N is set to 2, the more than 1st thru/or 2nd audio code translation send data is transmitted to each two transmission line.

[0205]Operation of treating parts other than the above is the same as that of the 4th working example. Working example which made still more desirable this example described above is the same as the 2nd working example.

[0206]The composition and operation of an audio code translation receiving set are the same as the 4th working example.

[0207](5.C) Operation effect : according to the 5th working example described above, audio code translation transmission equipment changes the same audio packet data into two coded data, and it transmits, vacating the time interval which changes uniformly or accommodative. The 1st audio code translation transmission section chooses the inputted audio packet data accommodative in accordance with the character or the rule defined beforehand of DIO, and transmits. The 2nd audio code translation transmission section reproduces to some packet data selected in accordance with the character or the rule defined beforehand of all the packet data or input audios accommodative, chooses the number which is the same as input data, or is different, and transmits.

[0208]In the code translation receiving set side, the high data of quality is chosen and outputted among the data which chose data without an error or lack by the packet unit from the coding packet data received normally, and was received from two transmission lines. As a result, even when using the unreliable transmission line where the high transmission error and packet loss of burst nature occur frequently, it is possible to prevent the probability that both two coded data will be transmitted accidentally becoming small, and remarkable degradation arising in the decoding audio after transmission.

[0209]Increase of a transmission band accompanying the 2nd coded data transmission can be small suppressed by making small a selected number of the 2nd coding packet data. In

addition, by intention of a situation of a transmission line, an audio sending person, or an audio addressee, the 1st thru/or the 2nd coded data can be transmitted to several transmission lines where zones differed, and influence of an error in a transmission line can be reduced further.

[0210]In a code translation receiving set, since what is necessary is just to decrypt at least one data out of two received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0211]In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory. Interleave [/ in addition to a time interval] may be sufficient as the 1st thru/or Nth code translation data.

[0212][A 6th embodiment] in a 6th embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Input compressed coded data and decrypt inputted coded data, Compression encoding is carried out so that it may become a compression ratio higher than it equivalent to inputted coded data or, The 1st audio code translation transmitting means that performs control which transmits some frames selected in accordance with character or a rule defined beforehand of all the frames or input audios accommodative using a predetermined transmission means, b) Decrypt inputted coded data, and carry out compression encoding so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, Some frames selected in accordance with character or a rule defined beforehand of all the frames of obtained coded data, or input audios accommodative, The 2nd which performs control which places a time interval which changes uniformly or accommodative, and transmits using transmission means same as or different from the 1st audio code translation transmitting means thru/or an audio code translation transmitting means of the Nth individual (N-1), c) Unite with a zone which can be used for the 1st thru/or each Mth transmission line, A compression ratio of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line.

[0213]The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, The coded data which received N coded data from the selected transmission line, and there is no transmission error, and there is no lack, and was received was extracted, and it has the selecting means to which a compression ratio chooses and outputs the lowest audio coded data out of the coded data of the same frame. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0214][The 6th working example] Working example is described [working example / of this invention / 6th] with reference to Drawings about this embodiment below that it should explain still in detail.

[0215](6.A) Outline : drawing 13 shows the 6th working example of this invention. As shown in drawing 13, it comprises the transmission line 1430 for transmitting the code translation transmission equipment 1400, the code translation receiving set 1420, and coded data of audio information. The integer N expresses the number of the coded data which code translation transmission equipment transmits. N uses two or more. The integer M expresses the number of the transmission line where N coded data is sent out, and makes it one or more.

[0216]The audio code translation transmission equipment 1400 performs predetermined compression encoding for audio information obtained by decrypting inputted audio information which was coded with a compression ratio higher than it equivalent to input data or, and transmits code translation data to the audio code translation receiving set 1420. Inputted audio information is coded to N coded data, and it transmits to the 1st thru/or the Mth transmission line as the 1st thru/or the Nth audio coded data.

[0217]As shown in drawing 13, this audio code translation transmission equipment is provided with the 1st thru/or Nth N audio code translation transmission section (the 1st thru/or Nth audio code translation transmission section) 1403, 1404, and 1405.

[0218]The audio information receive section 1401 receives audio information.

[0219]The audio decoding section 1402 decrypts inputted audio coded data.

[0220]The 1st audio code translation transmission section 1403 transmits coded data obtained by performing predetermined compression encoding to a frame inputted into code translation transmission equipment to an audio code translation receiving set.

[0221]The 2nd thru/or Nth audio code translation transmission section 1404 thru/or 1405 transmits coded data obtained by coding with a compression ratio higher than it equivalent to the 1st audio code translation transmission section 1403 or to an audio code translation receiving set. The 1st thru/or the Nth audio stream are transmitted to up to the 1st thru/or Mth transmission line.

[0222]Also in this working example, it is good also as composition which has a compression ratio of coding of the 1st thru/or Nth audio code translation transmission section 1403-1405 chosen in accordance with a zone which can be used for transmission of audio information in each transmission line 1430. An output of the 1st thru/or Nth audio code translation transmission section 1403-1405 is considered as composition outputted to the 1st thru/or the Mth transmission line 1430, and transmission in alignment with an intention of a state of a transmission line or an audio information sending person can be performed.

[0223]The audio code translation receiving set 1420 is the receiving transmission-line selecting

part 1406, receives N coded data from a transmission line which chose at least one transmission line and was chosen from M transmission lines which audio code translation transmission equipment transmitted, and performs decoding conversion.

[0224]The 1st thru/or the Nth coded data receive section 1407 thru/or 1409 which receive coded data transmitted by the 1st thru/or Nth audio encoding transmitting means 1403 thru/or 1405 with which the code translation transmission equipment 1400 is provided as the audio code translation receiving set 1420 was shown in drawing 13, It has the coded data reconstruction section 1410.

[0225]The coded data reconstruction section 1410 chooses and outputs data with the lowest compression ratio out of a maximum of N coded data which neither a transmission error nor lack has and was received in the coded data receive sections 1407 thru/or 1409.

[0226](6.B) Code translation transmission equipment : drawing 14 shows the detailed composition of the audio code translation transmission equipment in the 6th working example of this invention. Since it is easy, the number M of the transmission line which transmits 2 and coded data for the number N of the coded data which this equipment outputs is set to 2. When drawing 14 is referred to, have the decoding section 1501 which decrypts the inputted audio information, and the 1st audio code translation transmission section 1500, The 1st transmission frame / packet coding part 1502 that codes the decrypted audio information with a compression ratio higher than the data into which it was inputted, equivalent, or it, In order for a receiving set to detect the transmission error and packet loss of coded data which the 1st transmission frame / packet coding part 1502 outputted, It has the 1st error detecting code and frame / packet identification number adjunct 1503 that adds an error detecting code, and a frame / packet identification number, the 1st audio coded data is outputted, and it is transmitted by the predetermined transmitting means.

[0227]In drawing 14, the 2nd audio code translation transmission section 1510, The 2nd transmission frame / packet coding part 1504 that is coded with a compression ratio higher than the 1st audio code translation transmission section 1500, equivalent, or it, and is outputted, In order for a receiving set to detect a transmission error and packet loss of coded data which the 2nd transmission frame / packet coding part 1504 outputted, It has the 2nd error detecting code and frame / packet identification number adjunct 1505 that adds an error detecting code, and a frame / packet identification number, the 2nd audio coded data is outputted, and it is transmitted by predetermined transmitting means.

[0228]In this example, since M is set to 2 and N is set to 2, the more than 1st thru/or 2nd audio code translation send data is transmitted to each two transmission line. Operation of treating parts other than the above is the same as that of the 3rd working example.

[0229]An example which materialized still more preferably this example described above is the same as that of said 1st working example.

[0230]Composition and operation of an audio code translation receiving set are the same as said 3rd working example.

[0231](6.C) A operation effect : according to the 3rd working example described above, audio code translation transmission equipment decrypts inputted audio information, and it transmits, vacating a time interval which codes to two coded data and changes this uniformly or accommodative in the same audio information.

[0232]Out of coded data received normally, a compression ratio chooses low good coded data of tone quality per frame, and outputs the code translation receiving set side. As a result, even when using an unreliable transmission line where a high transmission error and packet loss of burst nature occur frequently, it is possible to prevent probability that both two coded data will be transmitted accidentally becoming small, and remarkable degradation arising in decoding tone quality after transmission.

[0233]Increase of a transmission band accompanying the 2nd coded data transmission can be small suppressed by making a compression ratio of the 2nd coded data high.

[0234]In addition, by intention of a situation of a transmission line, an audio sending person, or an audio addressee, the 1st thru/or the 2nd coded data can be transmitted to several transmission lines where zones differed, and influence of an error in a transmission line can be reduced further. In a code translation receiving set, since what is necessary is just to decrypt at least one data out of two received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0235]In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory. Interleave [/ in addition to a time interval] may be sufficient as the 1st thru/or Nth code translation data.

[0236][A 7th embodiment] in a 7th embodiment of this invention. To the two or more arbitrary integers N and the one or more arbitrary integers M, the code translation transmission equipment side, a) Input compressed coding packet data and decrypt inputted coding packet data, Compression encoding is carried out so that it may become a compression ratio higher than it equivalent to inputted coded data or, The 1st audio code translation transmitting means that performs control which transmits some packets selected in accordance with character or a rule defined beforehand of all the packets or input audios accommodative using a predetermined transmission means, b) Decrypt inputted coding packet data, and carry out compression encoding to packet data so that it may become a compression ratio higher than it equivalent to said 1st audio code translation transmitting means or, A transmission means which is the same as or different from the 1st audio code translation transmitting means in some packet data selected in accordance with character or a rule defined beforehand of all the obtained packet data or input audios accommodative is used, The 2nd which performs control

which places a time interval which changes uniformly or accommodative, and transmits thru/or an audio code translation transmitting means of the Nth individual (N-1), c) In accordance with a zone which can be used for the 1st thru/or each Mth transmission line, a compression ratio of the 1st thru/or Nth audio code translation transmitting means was chosen, and it has a means to send out to the 1st thru/or the Mth transmission line.

[0237]The code translation receiving set side chooses at least one transmission line from a d M piece transmission line, It has a selecting means to which a compression ratio chooses and outputs the lowest coding packet data out of packet data which received N coded data from a selected transmission line, and there is no transmission error, and there is no lack, and were received. Each means of the above-mentioned code translation transmission equipment and a code translation receiving set may realize its processing and function by the program executed by computer which constitutes the above-mentioned code translation transmission equipment and a code translation receiving set.

[0238][The 7th working example] Working example is described [working example / of this invention / 7th] with reference to Drawings about this embodiment below that it should explain still in detail.

[0239](7.A) An outline; composition and operation of this example are almost the same as the 6th working example, and as shown in drawing 13, they comprise the transmission line 1430 for transmitting the audio code translation transmission equipment 1400, the code translation receiving set 1420, and coded data. The integer N expresses the number of coded data which code translation transmission equipment transmits, and makes it two or more. The integer M expresses the number of a transmission line where N coded data is sent out, and makes it one or more.

[0240]Although the composition of audio code translation transmission equipment is almost the same as said 6th working example, operations of each part which constitutes this equipment differ a little. A point of difference is explained below.

[0241]The inputted audio coded data is decrypted, predetermined compression encoding is performed with a compression ratio higher than it equivalent to input audio information or, and code translation data is transmitted to an audio code translation receiving set.

[0242]The input frame coded data coded by an audio image code translation treating part comprises one piece or two or more packet data.

[0243]The 2nd thru/or Nth audio code translation transmission section, The coding packet data obtained by coding all or a part of packets of a packet coded in the 1st audio code translation transmission section with a compression ratio higher than it equivalent to the 1st audio code translation transmission section or are transmitted to an audio code translation receiving set. About operations other than the above, it is the same as said 6th working example fundamentally.

[0244]Although the composition of an audio code translation receiving set is almost the same as said 6th working example, operations of each part which constitutes this equipment differ a little. A point of difference is explained below.

[0245]In drawing 13, the coded data reconstruction section 1410, Like said 6th working example, there is neither a transmission error nor lack and it is received in the 1st thru/or Nth coded data receive section, It chooses as coded data which has a packet with the lowest compression ratio decrypted from a maximum of N coding packet data containing the compressed data of the same frame, and this selection is performed in the packet-data unit which code translation transmission equipment transmits. About operations other than the above, it is fundamentally the same as the 6th working example.

[0246](7.B) Code translation transmission equipment : although composition and operation of audio information code translation transmission equipment in this example are almost the same as audio information code translation transmission equipment in said 6th working example shown in drawing 14, The 1st transmission frame / packet coding part 1502 in drawing 14, Only operation of the 2nd transmission frame / packet coding part 1504, the 1st error detecting code addition and frame / packet number adjunct 1503, and the 2nd error detecting code addition and frame / packet number adjunct 1505 is different. Hereafter, a point of difference is explained.

[0247]In audio information code translation transmission equipment in this example, the 1st transmission frame / packet coding part 1502, and the 2nd transmission frame / packet coding part 1504, Coding packet data are generated so that a frame of coding packet data generated in the 1st transmission frame / packet coding part 1502 and a frame of coding packet data generated in the 2nd transmission frame / packet coding part 1504 may be in agreement. Operation of treating parts other than the above is the same as that of the 6th working example.

[0248]An example which materialized still more preferably this example described above is the same as that of the 2nd working example. Composition and operation of an audio code translation receiving set are the same as the 4th working example.

[0249](7.C) A operation effect : according to the 7th working example described above, audio code translation transmission equipment decrypts inputted audio information, and it transmits, vacating a time interval which codes to two coded data and changes this uniformly or accommodative in the same audio information. The 2nd coding transmitting means codes a packet coded by the 1st coding transmitting means.

[0250]The code translation receiving set side chooses and outputs good coded data of tone quality with a low compression ratio by a packet unit out of coded data received normally. As a result, even when using an unreliable transmission line where a high transmission error and packet loss of burst nature occur frequently, it is possible to prevent probability that both two

coded data will be transmitted accidentally becoming small, and remarkable degradation arising in decoding tone quality after transmission.

[0251] Increase of a transmission band accompanying the 2nd coded data transmission can be small suppressed by making a compression ratio of the 2nd coded data high. In addition, by intention of a situation of a transmission line, an audio sending person, or an audio addressee, the 1st thru/or the 2nd coded data can be transmitted to several transmission lines where zones differed, and influence of an error in a transmission line can be reduced further.

[0252] In a code translation receiving set, since what is necessary is just to decrypt at least one data out of two received coded data, compared with the usual audio decoding device, a required operation amount does not increase greatly.

[0253] In this example, although it is used combining code translation transmission equipment and a code translation receiving set, even if it uses it independently, respectively, it is satisfactory. Interleave [/ in addition to a time interval] may be sufficient as the 1st thru/or Nth code translation data.

[0254] [An 8th embodiment] Embodiment with another this invention is described. Drawing 15 is a figure showing a system configuration of an 8th embodiment of this invention. The coding equipment 40 which will output coded data if drawing 15 is referred to, and the code translation transmission equipment 10 of audio information, It has code translation receiving set 20_1 of audio information [two or more (K pieces)] - 20_K , and decoding device 30_1 of plurality (K pieces) connected to code translation receiving set $20_1 - 20_K - 30_K$. The coding equipment 40 makes a resource center which distributes coded data, and a publicly known server device is used. The code translation transmission equipment 10 consists of code translation transmission equipment (for example, 100 of drawing 1) of this invention explained with reference to said 1st [the] thru/or the 9th working example.

[0255] The code translation receiving set 20 of two or more audio information consists of a code translation receiving set (for example, 120 of drawing 1) of this invention explained with reference to said 1st [the] thru/or the 9th working example. The decoding device 30 is equipment (decoder) which decrypts and displays coded data from the code translation receiving set 20.

A ready-made article is used as it is.

[0256] In an example shown in drawing 15, the transmission line 13 used for each Information Transfer Sub-Division of the code translation transmission equipment 10, and each code translation receiving set $20_1 - 20_K$ is made into one per each code translation receiving set. That is, M of the M transmission lines 130 in working example of drawing 1 is made into one piece, and has composition provided with two or more code translation receiving sets 120 of

drawing 1. It is the same as that of said each working example to have N audio code translation transmission sections which are not illustrated, and to output stream data of N book of the code translation transmission equipment 10.

[0257]As one working example which makes the example of this embodiment, it is connected to an Internet communication network (or intranet), and the code translation transmission equipment 10 inputs the coded data transmitted for example, using UDP/IP protocol in coded data from the coding equipment 40. Processing of an audio code translation transmission section in which the code translation transmission equipment 10 is not illustrated performs processing corresponding to RTP (Real-time Transport Protocol), for example. Let the code translation receiving set 20 be a client terminal connected to an Internet communication network, for example.

[0258]In this working example, when a transmission line is radio, the code translation output (stream data of N book) from the code translation transmission equipment 10 UDP/IP protocol, It is outputted via the physical layer and transmitted to the code translation receiving set 20 of an address via a base station mobile packet communication system within the net via a router, Gateway, etc., In the code translation receiving set 20, the data by which code translation was carried out with the code translation transmission equipment 10 between the coding equipment 40 and the decoding device 30, It reconstructs and outputs to the coded data corresponding to coding of the basis of the coding equipment 40, and the decoding device 30 is performing coding of the coding equipment 40, and corresponding decoding processing, and voice response is carried out to the speech output unit which is not illustrated. The decoding device (decoder) 30 connected to the code translation receiving set 20 is good also as composition with which the terminal which may constitute as a terminal united with the code translation receiving set 20, or constitutes the code translation receiving set 20, the terminal (personal computer) which carries out a communication interface, etc. were equipped.

[0259]In this working example, the code translation receiving set 20 is considered as composition which outputs a control signal (request signal) to the code translation transmission equipment 10, and the code translation transmission equipment 10 transmits coded data to the code translation receiving set 20 in response to this control signal. It expresses that drawing 15 is that from which a control signal differs in a coding stream output from the code translation transmission equipment 10.

[0260]A control signal transmitted to the code translation transmission equipment 10 from the code translation receiving set 20 side is used, System information of the code translation receiving set 20, for example, an IP address, equipment information, Information, including a coding mode (for example, H.261 which is an ITU-T recommendation or H.263, MPEG-4 Visual which is ISO/IEC advice) etc. which can respond with the decoding device 30, by notifying the code translation transmission equipment 10. In the code translation transmission

equipment 10 which received a request signal, it may be made to perform code translation which suited the code translation receiving set 20 and the decoding device 30. In this invention, also when a transmission line is a cable, of course, it can apply.

[0261]In composition shown in drawing 15, two or more coding stream data (N) outputted to each transmission line 13 from the code translation transmission equipment 10, respectively like drawing 5, By a delay adjunct, a time interval may be provided mutually, multiplex may be carried out by a multiplexing part, and interleave of the coding stream data of N book is carried out by a multiplexing part, transmission order, a time interval is opened mutually, and it may be made to transmit a multiplexing output to a transmission line. It is good also as composition which provides a delay adjunct shown in drawing 5, and a multiplexing part in the code translation transmission equipment 10. In this case, the code translation receiving set 20 is provided with the separation part 511 of drawing 5, a multiplexing transmission packet received from a transmission line selected by a receiving transmission-line selecting part is divided into a packet of each stream, and extracting processing of coded data and reconstruction processing are performed. According to this working example, the code translation transmission equipment 10 receives coded data from the coding equipment 40 which makes a resource center, The code translation transmission equipment 10 can be changed into a system which has tolerance in a data loss in the transmission line 13, and a data error, it can transmit to the code translation receiving set 20 side, and an efficient code transmission suitable for transmission on the transmission line 13 can be performed. The decoding device 30 performs decoding processing corresponding to a coding mode of the coding equipment 40.

[0262]As for this invention, although it was based on each above-mentioned working example and this invention was explained above, it is needless to say that various modification which it is not limited only to composition of above-mentioned working example, and can be made if it is a person skilled in the art within the limits of invention of each claim of Claims, and correction are included.

[0263]

[Effect of the Invention]As explained above, even when the transmission line where the reliability which the high transmission error and packet loss of burst nature generate is low is used according to this invention, The probability that all N coded data will be transmitted accidentally becomes small, and the effect that it can prevent remarkable random ** arising in decoding tone quality is done so. The Reason is as follows.

[0264]Namely, in this invention, to the two or more arbitrary integers N and the one or more arbitrary integers M the code translation transmission equipment side, On the 1st thru/or Mth transmission line, have the 1st thru/or Nth conversion transmitting means, and the frame or packet of audio information, In accordance with a transmission rate, transmit all or a part, or

compression encoding of the audio information is carried out to N coded data after a decoding, Transmit vacating the time interval which changes uniformly or accommodative, and the 2nd thru/or Nth audio code translation transmitting means, It is because the inputted frame was coded and the code translation receiving set side had composition in which a compression ratio chooses and decrypts the low good coded data of tone quality by the frame or a packet unit most out of the coded data received normally from M transmission lines.

[0265]According to this invention, transmission in alignment with an intention of the state of a transmission line or an audio information sending person can be performed.

[0266]The Reason is because it had composition which can choose the compression ratio of the 1st thru/or Nth audio code translation transmitting means according to the 1st thru/or the transmission line of the Mth piece in accordance with the zone which can be used for transmission of audio information in each transmission line in this invention.

[0267]According to this invention, increase of the transmission rate by two or more coded data transmission can be controlled.

[0268]In this invention, the Reason the 2nd thru/or Nth audio code translation transmitting means, It is because it made it possible to code with a compression ratio higher than it equivalent to the 1st audio code translation transmitting means or, and to perform transmission of the coded data based on the 2nd thru/or Nth audio code translation transmitting means only to the frame which the 1st audio code translation transmitting means coded.

[0269]According to this invention, increase of the operation amount which a receiver takes can be controlled.

[0270]In this invention, as for the Reason, the code translation transmission equipment side generates the same frame **** coded data, Since the code translation receiving set side is choosing and decrypting only one piece by the frame or the packet unit out of two or more received coded data, it is a sake in a receiver having made it not decrypt two or more received coded data.

[Translation done.]